NAUSEA AND VOMITING

Antiemetics and PONV Prophylaxis: Who Gets What

In-hospital teaching · CA-1

THE QUESTION

Where the evidence disagrees

This topic was selected because an evidence synthesis beats a textbook on it: the trials disagree, or the guidance has moved recently.

THE EVIDENCE

What each source contributes, and how strong it is

Study design first — a cohort and a randomised trial do not carry the same weight.

Design	Year	Journal	What it found
Other	1999	Anesthesiology	The simplified risk score rests on four predictors - female sex, a history of
Other	2004	New England Journal of Medicine	In the 4,123-patient factorial trial ondansetron, dexamethasone and droperidol
Other	2004	New England Journal of Medicine	Because the interventions are similarly effective and independent, prophylaxis
Other	2013	Anesthesia and Analgesia	Pooled across 60 trials, 4 to 5 mg of dexamethasone reduced 24-hour nausea and
Other	2021	New England Journal of Medicine	In 8,725 patients having noncardiac surgery, a single 8 mg dose of dexamethaso
Other	2016	European Journal of Anaesthesiolog	Adding a single antiemetic to an inhalational anaesthetic gave the same overal

6 resolved citations behind this deck; every point above traces to one of them.

IN PRACTICE

What the cohorts and reviews add

6 findings, each on the slide that follows.

ANESTHESIOLOGY 1999

The simplified risk score rests on four predictors - female sex, a history of

The simplified risk score rests on four predictors - female sex, a history of motion sickness or previous postoperative nausea and vomiting,…

NEW ENGLAND JOURNAL OF MEDICINE 2004

In the 4,123-patient factorial trial ondansetron, dexamethasone and droperidol

In the 4,123-patient factorial trial ondansetron, dexamethasone and droperidol each cut the risk of postoperative nausea and vomiting by about 26%,…

NEW ENGLAND JOURNAL OF MEDICINE 2004

Because the interventions are similarly effective and independent, prophylaxis

Because the interventions are similarly effective and independent, prophylaxis is rarely warranted in low-risk patients, moderate-risk patients may…

ANESTHESIA AND ANALGESIA 2013

Pooled across 60 trials, 4 to 5 mg of dexamethasone reduced 24-hour nausea and

Pooled across 60 trials, 4 to 5 mg of dexamethasone reduced 24-hour nausea and vomiting as effectively as 8 to 10 mg, with a number needed to treat…

IN PRACTICE

The simplified risk score rests on four predictors - female sex, a history of

Other · Anesthesiology

The simplified risk score rests on four predictors - female sex, a history of motion sickness or previous postoperative

nausea and vomiting, non-smoking status and the use of postoperative opioids - and with none, one, two, three or four of them present the incidence of nausea and vomiting was 10%, 21%, 39%, 61% and 79%.

Apfel et al., Anesthesiology 1999 · PMID 10485781

IN PRACTICE

In the 4,123-patient factorial trial ondansetron, dexamethasone and droperidol

Other · New England Journal of Medicine

In the 4,123-patient factorial trial ondansetron, dexamethasone and droperidol each cut the risk of postoperative nausea and vomiting by about 26%, propofol by 19% and omitting nitrous oxide by 12%, and because the interventions acted independently of one another their relative risks simply multiply.

Apfel et al., New England Journal of Medicine 2004 · PMID 15190136

IN PRACTICE

Because the interventions are similarly effective and independent, prophylaxis

Other · New England Journal of Medicine

Because the interventions are similarly effective and independent, prophylaxis is rarely warranted in low-risk patients, moderate-risk patients may benefit from a single intervention, and multiple interventions should be reserved for high-risk patients - which is the multimodal approach the fourth consensus guidelines recommend for all at-risk surgical patients.

Apfel et al., New England Journal of Medicine 2004 · PMID 15190136

IN PRACTICE

Pooled across 60 trials, 4 to 5 mg of dexamethasone reduced 24-hour nausea and

Other · Anesthesia and Analgesia

Pooled across 60 trials, 4 to 5 mg of dexamethasone reduced 24-hour nausea and vomiting as effectively as 8 to 10 mg, with a number needed to treat of about 3.7 when used alone - so the bigger dose buys you nothing extra for this indication.

De Oliveira et al., Anesthesia and Analgesia 2013 · PMID 23223115

IN PRACTICE

In 8,725 patients having noncardiac surgery, a single 8 mg dose of dexamethaso

Other · New England Journal of Medicine

In 8,725 patients having noncardiac surgery, a single 8 mg dose of dexamethasone was noninferior to placebo for surgical-site infection at 30 days (8.1% versus 9.1%), including in patients with diabetes, so the infection worry that keeps residents from giving it is not supported.

Corcoran et al., New England Journal of Medicine 2021 · PMID 33951362

IN PRACTICE

Adding a single antiemetic to an inhalational anaesthetic gave the same overal

Other · European Journal of Anaesthesiolog

Adding a single antiemetic to an inhalational anaesthetic gave the same overall risk of postoperative nausea and vomiting as substituting propofol total intravenous anaesthesia with no antiemetic at all (relative risk 1.06), so changing the anaesthetic and adding a drug are alternatives rather than a hierarchy.

Schaefer et al., European Journal of Anaesthesiology 2016 · PMID 27454663

IN THE ROOM

What this changes about the next case

Colour is the strength of the evidence behind each step, not the urgency.

1. **1**
   The simplified risk score rests on four predictors - female sex, a history of motion sickness or previous postoperative nausea and vomiting, non-smoking status and the use of postoperative opioids - and with none, one, two, three or four of them present the incidence of nausea and vomiting was 10%, 21%, 39%, 61% and 79%.
2. **2**
   In the 4,123-patient factorial trial ondansetron, dexamethasone and droperidol each cut the risk of postoperative nausea and vomiting by about 26%, propofol by 19% and omitting nitrous oxide by 12%, and because the interventions acted independently of one another their relative risks simply multiply.
3. **3**
   Because the interventions are similarly effective and independent, prophylaxis is rarely warranted in low-risk patients, moderate-risk patients may benefit from a single intervention, and multiple interventions should be reserved for high-risk patients - which is the multimodal approach the fourth consensus guidelines recommend for all at-risk surgical patients.

4 **4**

Pooled across 60 trials, 4 to 5 mg of dexamethasone reduced 24-hour nausea and vomiting as effectively as 8 to 10 mg, with a number needed to treat of about 3.7 when used alone - so the bigger dose buys you nothing extra for this indication.

5 **5**

In 8,725 patients having noncardiac surgery, a single 8 mg dose of dexamethasone was noninferior to placebo for surgical-site infection at 30 days (8.1% versus 9.1%), including in patients with diabetes, so the infection worry that keeps residents from giving it is not supported.

KEY TAKEAWAYS

What to carry into the next case

> **The simplified risk score rests on four predictors - female sex, a history of**
> Anesthesiology 1999

> **In the 4,123-patient factorial trial ondansetron, dexamethasone and droperidol**
> New England Journal of Medicine 2004

> **Because the interventions are similarly effective and independent, prophylaxis**
> New England Journal of Medicine 2004

> **Pooled across 60 trials, 4 to 5 mg of dexamethasone reduced 24-hour nausea and**
> Anesthesia and Analgesia 2013

Count the risk factors, then give one drug from a different class for each one - prophylaxis is stratified by risk, not handed out by reflex.

QUESTIONS I'LL ASK YOU IN THE ROOM

1. Name her risk factors out loud. Which belong to the patient and which belong to your anaesthetic?
2. You gave her ondansetron and she is retching in recovery. Do you give her more ondansetron?
3. Why does the dexamethasone go in at induction and the ondansetron towards the end?
4. What would you change about the anaesthetic itself, rather than adding another drug on top of it?

ORAL BOARDS STEM

> *A 28-year-old non-smoking woman is having a laparoscopic cholecystectomy. She volunteers that she vomited for a full day after her wisdom teeth came out, and that she gets carsick. Your attending asks you how many risk factors she carries, roughly what her chance of postoperative nausea and vomiting is, and how many antiemetics she should leave the operating room having received.*

Count the risk factors, then give one drug from a different class for each one - prophylaxis is stratified by risk, not handed out by reflex.

SOURCES

[1] Apfel et al., Anesthesiology 1999 · PMID 10485781
[2] Apfel et al., New England Journal of Medicine 2004 · PMID 15190136
[3] Gan et al., Anesthesia and Analgesia 2020 · PMID 32467512
[4] De Oliveira et al., Anesthesia and Analgesia 2013 · PMID 23223115
[5] Corcoran et al., New England Journal of Medicine 2021 · PMID 33951362
[6] Schaefer et al., European Journal of Anaesthesiology 2016 · PMID 27454663